EGG QUALITY CHARACTERISTICS OF NOILER STRAIN COMPARED TO TWO OTHER COMMERCIAL STRAINS OF LAYERS

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ABSTRACT
The experiment was conducted using three strains of layers; Isa brown, nera black and noiler (60 each) to compare their egg quality traits of the three strains. The birds were fed with commercial feed and the study lasted 6 weeks. Each strain was randomly allocated into four replicates consisting of 15 birds per replicate in Completely Randomized Design (CRD). Two eggs were collected daily from each replicate per week to determine egg quality. The internal egg quality parameter were accessed after breaking and separating each of the components, the parameter considered for internal egg quality were yolk colour, yolk length and weight. Egg weight, length and width, shell weight and thickness were considered for external egg quality. A non significant influence of strain was detected in all parameters recorded except egg production, egg weight, yolk weight and yolk colour that were significant ($p<0.05$) among the strains. Isa brown had the significantly higher ($p<0.05$) egg production (80.57%) while noiler strain had the lowest value of 57.47%.Noiler recorded the highest values for egg weight (63.80g) and yolk weight (32.17g) while Isa brown had the lowest (58.00g and 28.11g, respectively)Values recorded for egg length, egg breadth, shell weight, yolk length and shell thickness were not significantly affected by the strain of layers and the ranges were 5.17 - 5.35mm, 3.80 - 4.10mm. 7.36 - 7.54g, 1.89 – 2.09mm and 0.34 – 0.36, respectively. Conclusively, egg production of noiler was poor, but other egg qualities were better.
Keywords: Poultry, Isa brown, Nera black, Noiler, Egg Quality.

INTRODUCTION
The internal and external egg quality traits are of major importance to the egg industry worldwide (Ahmadi and Rahimi, 2011). Some researchers have studied the chicken egg quality from different perspectives. It has been reported that the quality of the chicken egg is influenced by genetic and non-genetic factors such as season, environment and feed intake (Ahmadi and Rahimi, 2011). Egg quality traits had been reported to influence embryo development, hatchability, and growth performance of chicks (Khan, 2002). There are reports on the relationship between egg size and egg quality characteristics (Sarica *et al.,* 2012; Abanikanda, 2007). Egg quality characteristics are affected by genotype and age (Zita *et al.,* 2009). According to Pradeepta *et al.* (2015), egg shell thickness of at least 0.33 mm was necessary for the eggs to have at least a 50% chance to stand without breakage under normal handling condition. The shell thickness and porosity help to regulate the exchange of carbon dioxide and oxygen between the developing embryo and the air during incubation (Roque and Soares, 1994). However, yolk colour is a function of feed not breeds Garba *et al*. (2016).Pradeepta *et al.* (2015) reported that white Leghorn had optimum egg weight (57.78g) with albumen height (8.41mm} and H.U. (92.00) and Roberts and Leary (1999) reported that albumen quality was influenced by many factors such as storage time, temperature, environmental conditions , hen age, strain of bird and nutrition. This study evaluated egg quality traits of three different strains of layers.

MATERIALS AND METHODS
The experiment was carried out at Oyo State College of Agriculture and Technology poultry unit of Teaching and Research Farm. A total number of 180, thirty week old birds consisting of 60 each of Noiler, Isa Brown and Nera black strains were obtained from poultry unit of the college farms and used for the study. The layers were allotted to three treatments with four replicates each and fifteen birds per replicate. The birds were fed commercial layer feed for the six weeks. Two eggs were collected daily from each replicate for six weeks to determine egg quality. The parameters considered were egg production, egg weight, egg length, egg breadth, shell weight, and shell thickness. The internal egg quality parameters were assessed after breaking and separating each of the components, the parameters considered were yolk colour, yolk length, and yolk weight.

Results and discussion

Results of the egg quality of the three strains were represented in table 1 and showed the egg weight, egg length, egg breadth, shell weight, yolk weight, yolk length, yolk colour, and shell thickness. Significant ($p<0.05$) effect of strain on egg production, egg weight, yolk weight and yolk colour among the strains was observed. Isa brown had the significantly highest egg production (80.57%) while noiler strain recorded the lowest value of 57.47%. Egg and yolk weight of noiler were the highest (63.80g and 32.17g, respectively) and significant to values recorded for isa brown (58.03g and 28.50g, respectively) and nera black (59.72g and 30.59g, respectively). Yolk weight as a percentage of egg weight was not significant. Yolk colour scores of isa brown (4.86) and nera black (4.35) were similar but higher than value recorded for noiler (2.23). Values recorded for egg length, egg breadth, shell weight, yolk length and shell thickness were not significantly affect by the strain of layers and the ranges were 5.17 - 5.35mm, 3.80 - 4.10mm. 7.36 - 7.54g, 1.89 – 2.09mm and 0.34 – 0.36, respectively.

DISCUSSION

The non significant effect of strain on most egg quality traits contradicted the report of Zita *et al*., (2009) who reported that egg quality characteristics are affected by genotype and age. Pradeepta *et al.* (2015) found eggs collected from 40 weeks aged white Leghorn hens have optimum egg weight (57.78g), and shell characteristics (6 g, 0.32 mm). The quality of eggs depends on physical make up and chemical composition of its constituent parts (Chukwuka, 72011). According to Tadesse *et al*. (2013) the difference in egg shell thickness was due to layer strain difference and Zita *et al*. (2009) reported that difference in egg shell thickness was the effect of layer type difference, environmental conditions and feed quality.

The egg length of isa brown was the highest value and the lowest was recorded in noiler which showed no significant difference. The egg breadth had no significant effect and was similar to that reported value by Roberts and Leary (1999). The shell weight showed no significant difference ($p>0.05$), the shell thickness was also not significantly affected ($p< 0.05$) by the strains

Yolk colour was significantly affected by strain with noiler recorded the lower value than isa brown and nera black strains. This contradicted Garba *et al*. (2016) who stated that yolk colour is a function of feed and not breeds.

Table 1: Egg quality characteristics of the three strains experimental layers

Parameters	Isa brown	Black near	Noiler	SEM
Hen day production (%)	80.57[a]	72.45[b]	57.47[c]	2.51
Egg weight (g)	58.03[b]	59.72[b]	63.80[a]	1.92
Egg length (mm)	5.35	5.36	5.17	0.08
Egg breadth (mm)	4.10	4.20	3.80	0.28
Shell surface area mm^2	14.96	15.56	16.96	0.27
Albumen weight (g)	34.16	36.94	37.59	0.85
Albumen percentage (%)	57.52	54.78	55.25	1.07
Shell weight (g)	7.54	7.40	7.36	0.45

Shell percentage (%)	14.11	14.73	12.59	1.03
Yolk weight (g)	28.50[c]	30.59[b]	32.17[a]	0.44
Yolk percentage (%)	20.69	20.68	20.60	0.79
Yolk length (mm)	2.09	2.08	1.89	0.09
Yolk colour	4.86[a]	4.35[a]	2.23[b]	0.29
Shell thickness (mm)	0.34	0.36	0.35	2.25

[ab] means on the same row with the different superscripts were significantly different ($p<0.05$)

There were no significant differences in all the strains as regards the egg shell thickness and ranged between 0.34 and 0.36, this confirmed the report of Khan *et al*. (2002) who stated that eggshell thickness between 0.33 and 0.35 mm will support hatchability. Egg production was affected by strain, isa brown had the highest value and the lowest was from noiler strain. Genetic variation in egg production between breeds, strains and lines had been reported (Hocking *et al.,* 2003). Egg weight was significantly different, the highest value was recorded in noiler and the lowest value was isa brown. Egg size as an external trait is affected by factors such as maturity, weight, age of flock, breed / genotype, diseases, nutrition and level of feeding. The increase in egg size with age is a result of increase in the yolk size, albumen and shell weight, although these increases are not proportional (Roberts and Leary, 1999). Egg size can also be affected by nutrition, the intake of protein, specific amino acids such as methionine and lysine, energy, total fat and the essential fatty acids, linoleic acid.

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